

CLAIMS

1. A control circuit for a construction machine, said control circuit comprising an open center circuit including center bypass lines passing through at least a boom operating valve, a stick operating valve, and a bucket operating valve that control hydraulic fluid fed from hydraulic pumps to boom cylinders, a stick cylinder, and a bucket cylinder and subsequently returned through return lines to a tank, said boom cylinders operate a boom, said stick cylinder operate a stick connected to a distal end of said boom, and said bucket cylinder serving to operate a bucket connected to a distal end of said stick, wherein said control circuit further includes:

a pressure-compensating flow control valve provided on a return line for hydraulic fluid returned from a rod side of said stick cylinder to said tank;

a pressure sensor for detecting pressure of hydraulic fluid fed to a head side of said boom cylinders; and

a pressure control valve for controlling a portion of the center bypass line that passes through said boom operating valve so as to increase the pressure in accordance with an increase in the pressure detected by said pressure sensor, said portion being downstream from said boom operating valve.

2. A control circuit for a construction machine as claimed in claim 1, wherein said control circuit further includes:

a pressure sensor for detecting pressure of hydraulic fluid fed to the rod side of said stick cylinder; and

a pressure control valve for controlling a portion of the center bypass line that passes through said stick operating valve so as to increase the pressure in accordance

with an increase in the pressure detected by said pressure sensor, said portion being downstream from said stick operating valve.

3. A control circuit for a construction machine as claimed in claim 1 wherein:

each pressure control valve is integrated with an orifice and a relief valve so as to form a negative flow control load pressure compensating valve, said orifice and relief valve serving to retrieve negative flow control pressure from the corresponding center bypass line in order to control pump discharge rate.

4. A control circuit for a construction machine as claimed in claim 1, wherein said pressure-compensating flow control valve further comprises:

a spring for setting a differential pressure; and
a pressure compensation deactivation portion that serves to increase set load of said spring in accordance with increase in load pressure applied to said head side of said stick cylinder, and, when the load pressure to said head side is a predetermined level or higher, increase the set load of said spring to such a level as to deactivate pressure compensation of flow control.

5. A control circuit for a construction machine as claimed in claim 2 wherein:

each pressure control valve is integrated with an orifice and a relief valve so as to form a negative flow control load pressure compensating valve, said orifice and relief valve serving to retrieve negative flow control

pressure from the corresponding center bypass line in order to control pump discharge rate.

6. A control circuit for a construction machine as claimed in claim 2, wherein said pressure-compensating flow control valve further comprises:

a spring for setting a differential pressure; and a pressure compensation deactivation portion that serves to increase set load of said spring in accordance with increase in load pressure applied to said head side of said stick cylinder, and, when the load pressure to said head side is a predetermined level or higher, increase the set load of said spring to such a level as to deactivate pressure compensation of flow control.

7. A control circuit for a construction machine as claimed in claim 3, wherein said pressure-compensating flow control valve further comprises:

a spring for setting a differential pressure; and a pressure compensation deactivation portion that serves to increase set load of said sprint in accordance with increase in load pressure applied to said head side of said stick cylinder, and, when the load pressure to said head side is a predetermined level or higher, increase the set load of said spring to such a level as to deactivate pressure compensation of flow control.

8. A control circuit for a construction machine as claimed in claim 5, wherein said pressure-compensating flow control valve further comprises:

a spring for setting a differential pressure; and a pressure compensation deactivation portion that serves to

increase set load of said spring in accordance with increase in load pressure applied to said head side of said stick cylinder, and, when the load pressure to said head side is a predetermined level or higher, increase the set load of said spring to such a level as to deactivate pressure compensation of flow control.